

Shedding Light On Energy

Your job:

1. Identify the source of the schools energy as renewable or nonrenewable and determine the amount of energy that Skyview Middle School uses hourly, daily, and monthly.
2. Compare calculated energy use and estimated cost to actual energy use and cost for the school.
3. Develop a plan to change the source of energy and/or reduce the amount of energy used by implementing alternative sources of energy.
4. Inform society about what it happening with energy in your school and your plan to improve energy usage. You can choose to either create a newspaper front page or an audio/video newscast focused on energy news from your town, school, state and/or home and neighborhood.

Requirements:

You can choose to work individually or in groups of up to 5 (groups must be in the same class period).

*See attached contest forms for contest rules, topics, and judging criteria.

Preparation:

In order to prepare for this project you must:

1. Collect school-wide data as a class on energy usage and cost.
2. Understand the various types of energy sources, including alternative energy sources used in the United States; **biomass, coal, geothermal, hydro, natural gas, nuclear, petroleum, solar, and wind** and explain the difference between **renewable and nonrenewable** resources.
3. Understand energy conservation and efficiency.
4. Be able to use this information to construct an effective and compelling argument.

Contest: Nationwide contest for all students in grades 5-8. Prizes include money for the top 4 winners and a new science/energy library for the school. If you would like to participate in the contest, we will submit all those projects that are done well (at least a 90%) to enter the competition for money. All projects must be complete in the correct format by March 18th, 2011..

How you are being graded:

		Point Value
Topic	<ul style="list-style-type: none">• Is the topic focused on energy?	10 points
Quality of Reporting	<ul style="list-style-type: none">• How well does the material portray subject matter in an objective and accurate way?• How well does the material incorporate facts the student has learned about energy?	30 points
Quality of Content	<ul style="list-style-type: none">• How creative is the content in the way that it communicates energy news?• Is it effective and compelling?• Is the content relevant to how energy impacts the student's or students' daily lives?	30 points
Quality of Presentation	<ul style="list-style-type: none">• Is the material well organized?• Does it communicate information clearly?• Is the content well structured with clear transitions?• Is the material accurately presented with a minimum of mistakes?	30 points
	Total	100 points

Energy Data Collection for Skyview Middle School

Group A- (approximately 8-10 students)

1. Count the number of fluorescent lights in the school. Include: the cafeteria, the gym, the hallways, the library, and the classrooms (only count 1 Math room, 1 LA or S.S. room, and one of each Science room). Use the map to count the number of classrooms to get the total number of lights and bulbs.
2. Determine how much energy (in Watts) each light bulb uses on a daily basis. Research as necessary. (Assume the lights are on for 10 hours per day). Units should be Watts/Day.
3. Using the number of light bulbs in the school and the energy used for each bulb, determine the total energy the school uses daily on light bulbs.
4. Determine the monthly usage of energy due to light bulbs.
5. Compare your data table with the rest of the people in your group.
6. After deciding on a final answer share your results with the class in the class period data table.

Group B- (approximately 8-10 students)

1. Count the number of computers and printers in the school. Include: the computer lab, the Engineering lab, the classrooms, the library, and the computer carts (only count 5 classrooms then take the average number to determine the school-wide classroom number). Use the map to count the number of classrooms to get the total number.
2. Determine how much energy (in Watts) each computer and printer uses. Research as necessary. (Assume the computers and printers are plugged in for 24 hours per day). Units should be Watts/Day.
What to do if wattage isn't listed ... If no wattage is listed on the device, take the Amps the appliance uses and multiply by the number of volts. The result is the wattage. Most small appliances use 120 volts - large appliances are usually 240.
3. Using the number of computers and printers in the school and the energy used for each computer/printer, determine the total energy the school uses daily on computers.
4. Determine the monthly usage of energy due to computers and printers.
5. Compare your data table with the rest of the people in your group.
6. After deciding on a final answer, share your results with the class in the class period data table.

Group C- (approximately 8-10 students)

1. Count the number of major appliances (refrigerators, microwaves, toasters, copy machines, televisions, LCD projectors and anything else plugged in to the wall (not computers and printers)

in the school. Include: the lunch rooms in each grade level, the cafeteria/kitchen, the CFS room, and the office.

2. Determine how much energy (in Watts) each appliance uses. Research as necessary. (Assume the appliances are plugged in for 24 hours per day). Units should be in Watts/Day. **What to do if wattage isn't listed ... If no wattage is listed on the device, take the Amps the appliance uses and multiply by the number of volts. The result is the wattage. Most small appliances use 120 volts - large appliances are usually 240.**
3. Using the number of each appliance in the school and the energy used for each appliance, determine the total energy the school uses for each appliance daily. Add the total energy of each appliance to determine the total energy for ALL appliances.
4. Determine the monthly usage of energy due to appliances.
5. Compare your data table with the rest of the people in your group.
6. After deciding on a final answer, share your results with the class in the class period data table.

Skyview Energy Data Collection

Source of Energy	Number in the School		Energy Use (Watts)		Hourly Use (Watts/Hour)	Hours Used	Daily Use (Watts/Day)	Days/ Month	Monthly Use (Watts/ Month)
Lighting									
Light Bulbs		x		=		x 10=		x24=	
Computer									
Computer		x		=		x 24=		x30=	
Printers		x		=		x24		x30=	
Major Appliances									
Refrigerators		x		=		x 24=		x30=	
Microwaves		x		=		x 24=		x 30=	
Copy Machines		x		=		x 24=		x 30=	
Televisions		x		=		x 24=		x 30=	
Projectors		x		=		x24		x30=	
Total									

In case you need to convert your units, use the scale below:

Kilo	Hecta	Deca	base	Deci	Centi	Milli
1000	100	10	1	.1	.01	.001

Determine Cost for Energy Consumption

1. For your group, determine the **daily** and **monthly** energy costs for your energy source using the following website: <http://www.csgnetwork.com/elecenergycalcs.html>

Make sure to use the correct section.

Lights= Lighting

Computers= Miscellaneous Appliances

Major Appliances= Kitchen Appliances and Miscellaneous Appliances

2. Complete the data table with estimated costs:

Source of Energy	Daily Use (Copy from table)	Daily Cost \$	Monthly Use (Copy from table)	Monthly Cost \$
Lighting				
Computers and Printers				
<u>Major Appliances:</u> Kitchen-				
Miscellaneous (TV)-				
Total				

3. Compare your results with the actual school Utility bill.
Are your results the same or different? Why?

Possible Reasons:

Skyview Middle School Plan for Energy Improvement

1. Research alternative sources of energy. Use the following website <http://www.scholastic.com/energytour/?eml=SMP/e/20110210/email///USCOC/SL1/////>
OR the library books to complete the table below.

Source of Energy	Renewable or Nonrenewable?	Picture	Information
Biomass			
Coal			
Geothermal			
Hydro			
Natural Gas			
Nuclear			
Petroleum			
Solar			

Wind			

2. Using your knowledge of alternative forms of energy and your knowledge of the Colorado region, determine which form of energy would be the most effective for Skyview.

Energy Choice:

3. Write/Develop a plan for improving the energy usage at Skyview. In a complete paragraph include:
 - 1) Ways to reduce our current energy usage
 - 2) Reasons for implementing an alternative energy source at Skyview
 - 3) A decision about which alternative energy source you have chosen and why

Shedding Light On Energy Final Project

In your final project you will either choose to create the front page of a newspaper OR an audio/video newscast.

Final project will include:

1. The process for energy data collection
2. Results from the school data collection
3. Your plan for improving the energy usage at Skyview
 - Ways to reduce our current energy usage
 - Reasons for implementing an alternative energy source at Skyview
 - A decision about which alternative energy source you have chosen and why